



Pest Management in Ontario Hazelnuts

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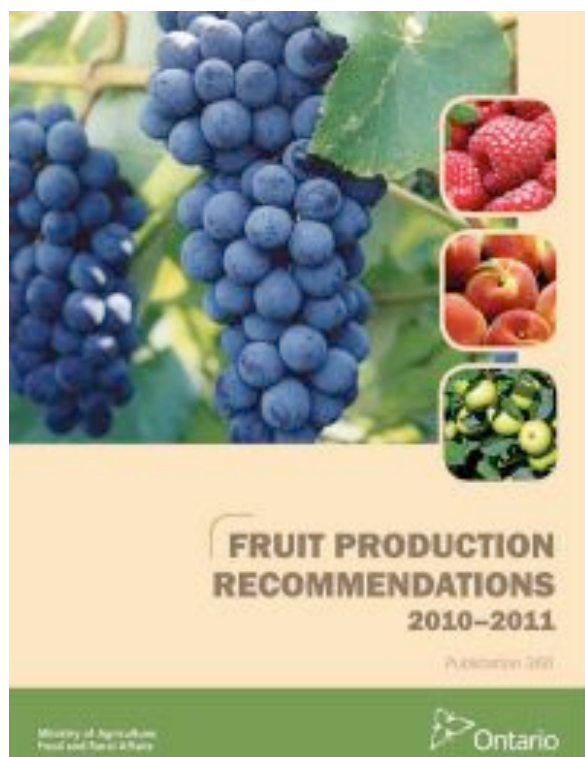
Overview

- Pesticides for Ontario hazelnuts
- Insect, disease and vertebrate pests of hazelnut in Ontario
- Weed management

Pest Control Products for Hazelnut in Ontario

- Limited number of products registered
- 9 active ingredients currently registered by Pest Management Regulatory Agency (PMRA)
- Tools for growers:

OMAFRA Publication 360



PMRA Label Search

www.pmra-arla.gc.ca

“Search Pesticide Labels”

The image is a screenshot of a web browser window displaying the 'Search Product Label' page from the PMRA (Pest Management Regulatory Agency) website. The browser's address bar shows the URL 'http://pr-pmra-arla.gc.ca/portal/page?_pageid=34,179516_cdd=portal8_schena=PORTAL'. The page has a header with the Canadian flag and the text 'Health Canada Santé Canada'. Below the header is a navigation bar with links for 'Home', 'Contact Us', 'Help', 'Search', 'Canada Now', 'About Us', 'Product Information', 'News', 'Contact Us', and 'Health News'. The main content area is titled 'Product Information' and contains a search form. The form has a 'Search Field' with a dropdown menu set to 'Contains', and a 'Operator' dropdown set to 'And'. There are four rows of search criteria, each with a 'Select Field--' dropdown, a 'Contains' dropdown, and an 'Add' button. Below the search criteria is a 'Year of Expiry' field with a dropdown menu and a 'Date' field with a note: 'Year must be a four digit number between 1927 & 9999'. There are two sections of checkboxes: 'Registration Status' with options 'Registered' (checked), 'Exempted', and 'Historical'; and 'Marketing Type' with options 'Domestic' (checked), 'Commercial', 'Manufacturing Concentrate', 'Technical Active', 'Restricted', and 'Historically not specified'. At the bottom, there is a 'Search Full Contents of Labels' section with a 'Full-Text' input field and two buttons: 'Submit Search Requirements' and 'New Search'.



<http://www.omafra.gov.on.ca/english/crops/minoruse>

- Focus – bring pest control products to Canadian minor and specialty crop growers that would otherwise not be marketed to them because of their unique and/or limited production area
- Similar to US IR4
- 2002-2010 – 10 product registrations on tree nuts crop group
- Four products currently under review by PMRA
- More products currently being prepared for submission

Pests of Hazelnut in Ontario



- **Diseases**

- Eastern Filbert Blight
- Bacterial Blight



- **Insects**

- Mites
- Aphids
- Japanese Beetle
- Spring-feeding caterpillars
- Filbertworm?



- **Vertebrates**

- Birds
- Mammals

Eastern Filbert Blight - Management



Photo: G. Hudler, Cornell University

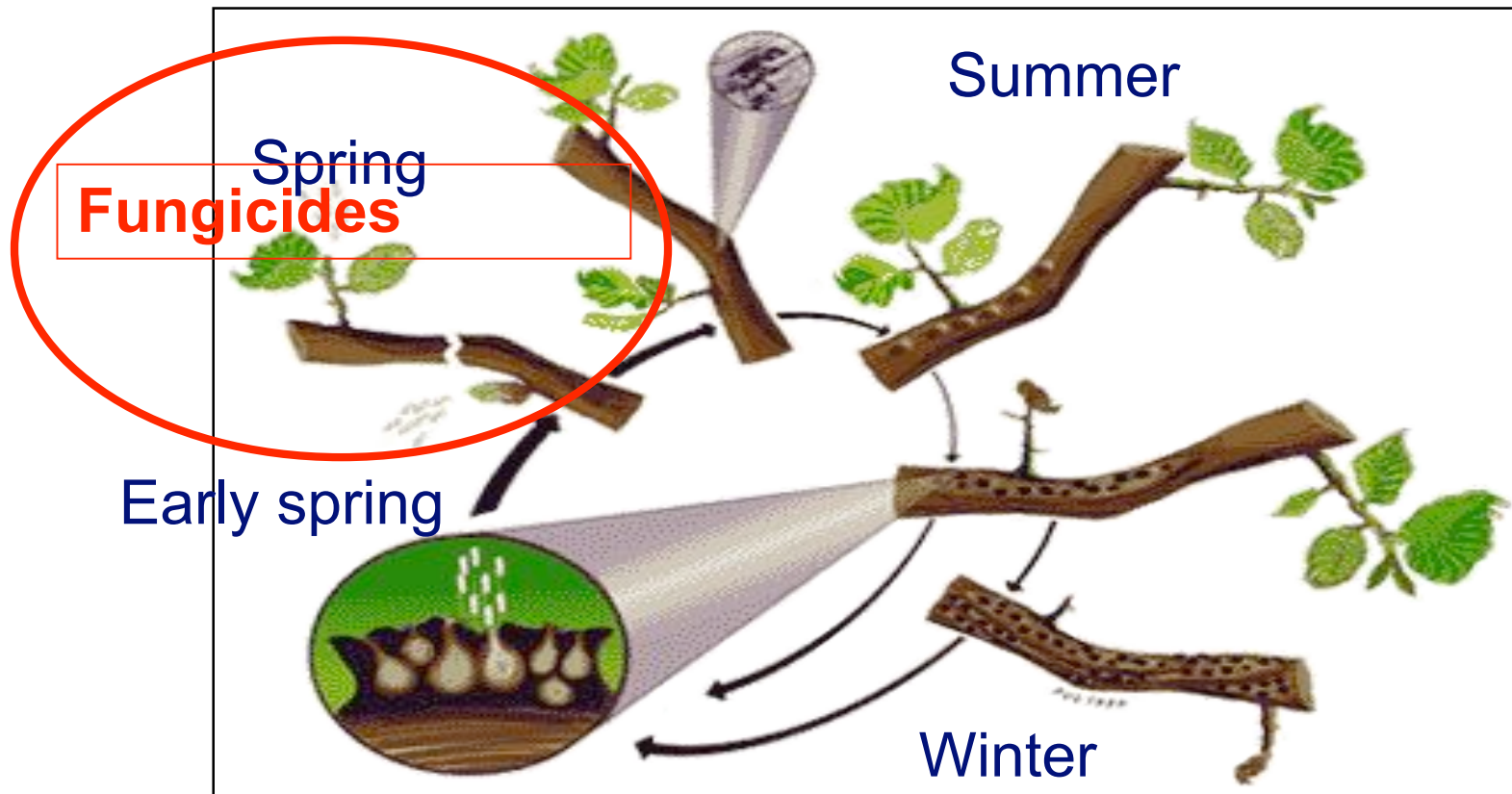


Photo: landscapeonline.com

- Resistant varieties
- Immediately prune and destroy diseased material to slow spread
- Destroy escaped seedlings
- **Registered Products**
 - Guardsman Copper Oxychloride/Copper Spray (copper)
 - Flint (trifloxystrobin)

Notes on Filbert Blight Fungicides

- Preventative - not effective after fungus has penetrated plant tissue.
- Fungicides must be on new growth before spores land (apply after bud break)
- Good coverage of all new growth required.
- Flint is a strobilurin – to avoid development of resistance, rotate with Copper!



Source: Oregon State University

Quadris – registered but not recommended for tree nuts in Ontario



- Severe damage to a number of varieties of apple.
- Drift concerns due to proximity of Ontario tree nuts to apple orchards.



Bacterial Blight – *Xanthomonas arboricola* pv. *Corylina*

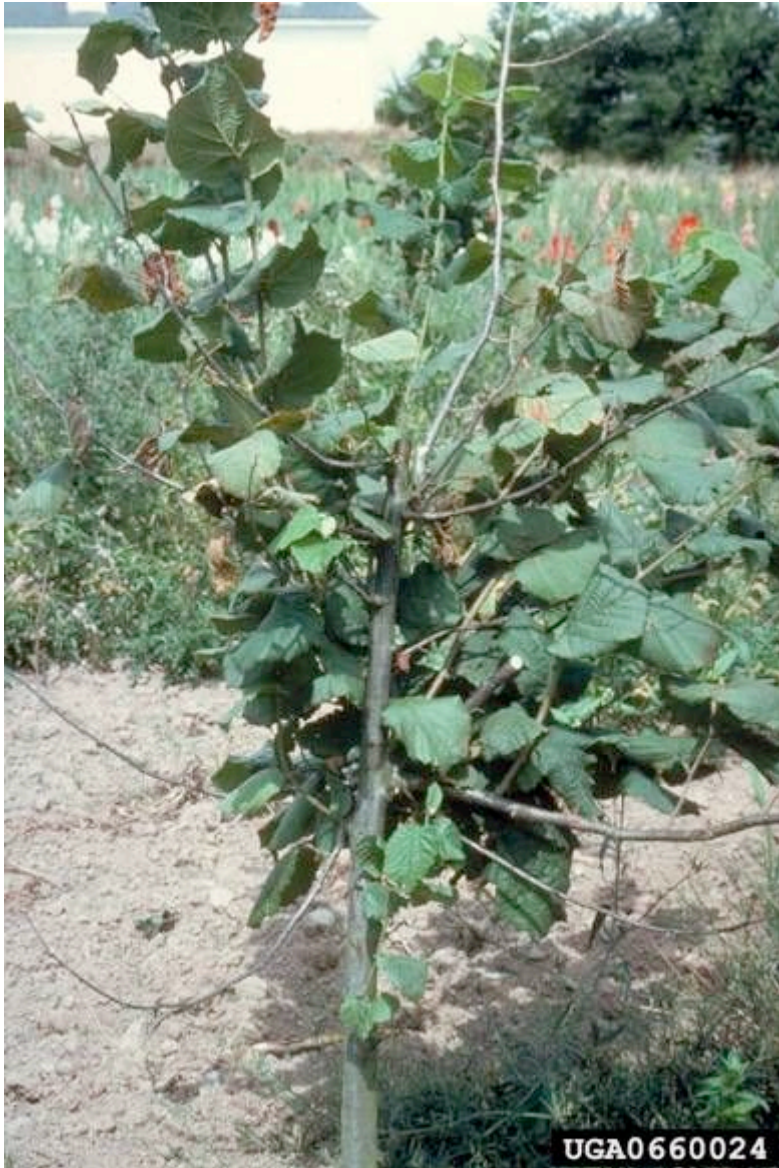


Small, angular,
reddish brown
water-soaked spots



Photos: www.atlasplantpathogenicbacteria.it

Bacterial Blight Management



- Clean nursery stock
- Pruning (below cankers) in winter
- Sanitize pruning tools
- Registered products
 - Guardsman Copper Oxychloride, Copper Spray (copper)
 - Apply in fall before rains

Mites



Two-spotted spider mite



European red mite

Filbert Bud Mite



Bud mites



- Two species – *Phytoptus avellanae* and *Cecidophyopsis vermiformis*
- Overwinter inside flower buds.
- In spring, leave damaged buds and migrate to leaves and then newly forming buds.
- Very brief exposed period – timing of controls important
- Feeding causes swelling and death of buds.





Mite management



- Bud mite resistant varieties
 - Small, tight buds resist penetration by mites
- Predatory mites
- Bud mites – sprays ineffective when mites are inside buds
- Registered Products:
 - Opal Insecticidal Soap (potassium salts of fatty acids)
 - Acramite 50WS (bifenazate) for two-spotted spider mite and red mites



Aphids



Damage

- Filbert aphid and other species
- Drain fluids and nutrients from plant, causing distorting and wilting

Management

- Encourage beneficial insects
- Avoid overuse of nitrogen
- Registered Products:
 - Movento 240 SC (spirotetramat)
 - Opal Insecticidal Soap
 - Lagon/Cygon – young trees (dimethoate)



Japanese Beetle

Popillia japonica

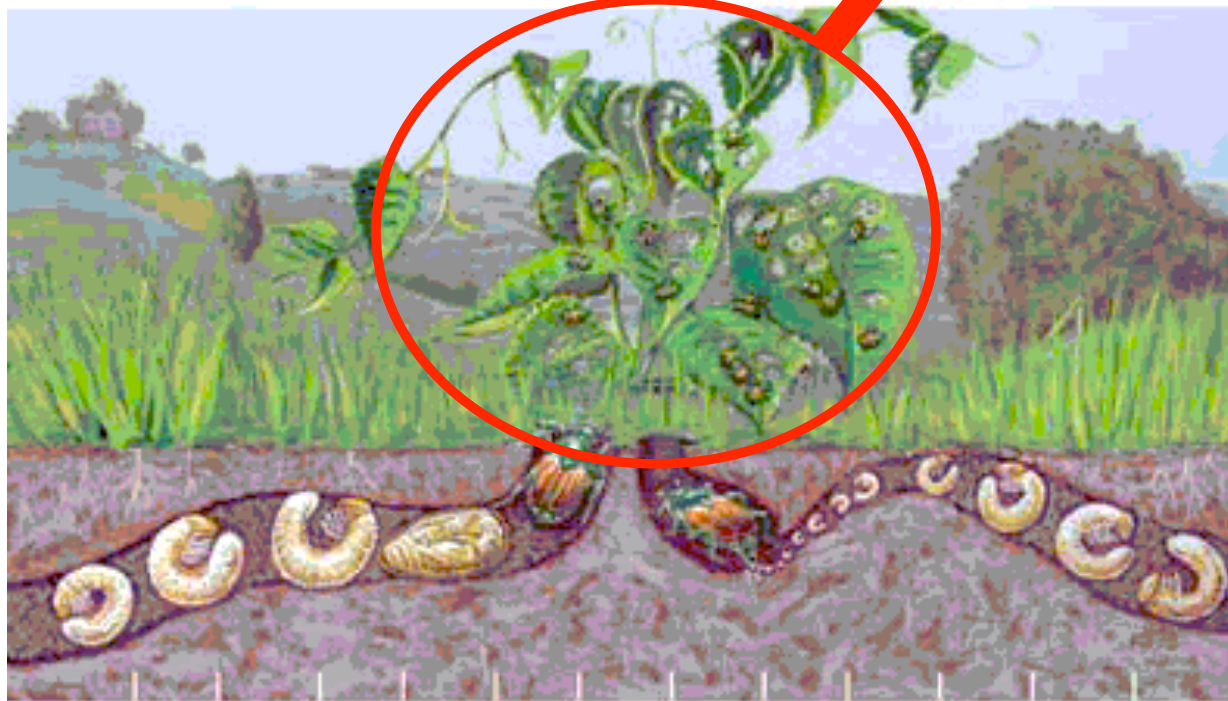


Illustration by Joel Floyd - USDA, APHIS, PPQ

Japanese Beetle Damage and Management



- Significant defoliation
- Young, establishing trees
- No registered products
- Avoid locating new orchards near vineyards, turf or grassy areas



- Pheremone traps not effective
- Beneficial nematodes? Probably not!

Spring-feeding caterpillars



- Various moth larvae that feed on foliage in early spring
- Leafrollers, tent caterpillars, gypsy moth, etc.
- So far, defoliation often not harmful to healthy established trees

Management

- Conserve beneficial insects by minimizing pesticide use
- Registered Products (Leafrollers):
 - Dipel (*Bacillus thuringiensis*)
 - Surround (kaolin clay)
 - Altacor (chlorantraniliprole/Rynaxypyr)

Filbertworm – No news is good news!



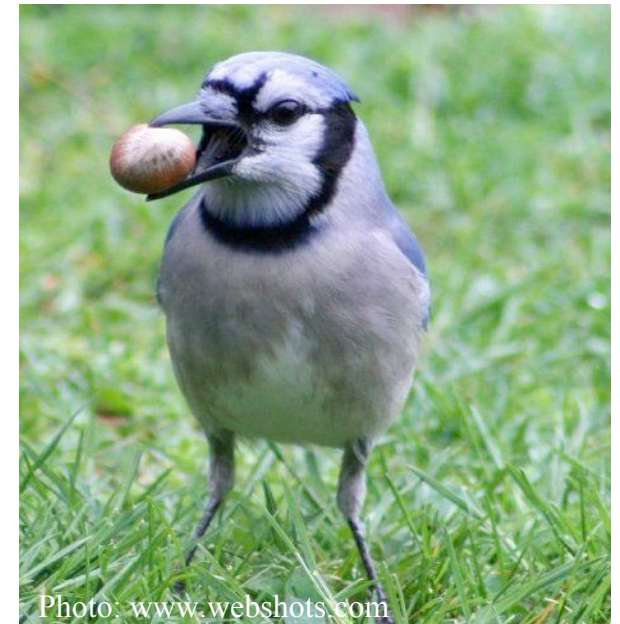
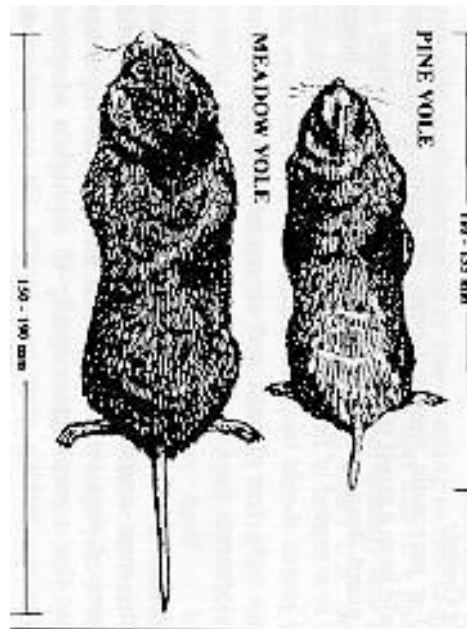
- Serious insect pest of hazelnuts in other areas
- Larvae bore into acorns and hazelnuts
- Observed in acorns in Ontario and Quebec, not yet reported from commercial hazelnut orchards

- Monitoring in southwestern Ontario orchards 2009-2010: No detections to date!



Vertebrates

- Feed on foliage, buds, roots, bark or nuts
- Crop loss, reduced growth
- Climbing damage to branches



Vertebrate management

1. Location:

- away from hydro lines, wooded areas and other natural habitat

2. Physical exclusion:

- Netting (birds)
- Fencing (deer, raccoons)
- Tree shelters (young trees)
- Tree guards (rodents)



Photo: www.goodfruit.com



Photo: E. Sagor, flickr.com



Photo: Smart Net Systems

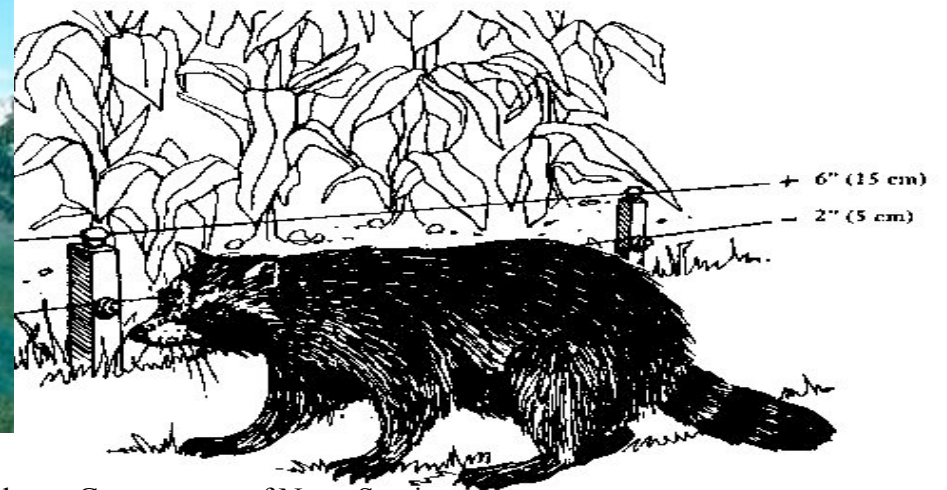


Photo: Government of Nova Scotia

Vertebrate management

3. Auditory deterrents

- Propane-fired bird scaring cannons
- Electronic sound devices



4. Visual deterrents

- Scare-eye balloons, streamers, flashtape, flashing lights, etc.

➤ Considerations:

- Neighbour disruption
- Ineffective against blue jays, others
- Location, type and timing must be varied



Vertebrate management

5. Predators

- Encourage natural predation of rodents by mowing grass to remove cover for voles
- Falconry (for birds)
- Dogs (deer deterrent)

6. Baits and bait stations

- Registered pest control products
- For mice and voles only
- Ensure product is registered on hazelnuts and you are complying with all safety instructions on label



Vertebrate management

7. Hunting and Trapping

- Wildlife in Ontario are governed by various provincial and federal acts
- Governs what/where/when nuisance wildlife may be hunted or trapped
- A permit is required to remove problem wildlife in orchards
- Consult Ministry of Natural Resources for more information on requirements

Weed Management

- Weed control critical for young trees
- Weed-free area 1 m in diameter
- Limited pesticides currently registered on hazelnut
 - OMAFRA Publication 75 – Weed Control
- In the works - herbicide trials for tree nuts in Harrow
- Pre-plant control of perennial weeds
- Weekly cultivation during spring/summer
- Mulch 5-10 cm thick, 1-2 m wide diameter. Keep mulch away from bark.



Photo: Iowa Farm Equipment



For more information:

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Thank you!

Questions?

Birch and Beech Girdler



Eastern Filbert Blight Damage



Photo: Jay W. Pschiedt



Photo: Jeff Stone

- Football-shaped, raised black cankers
- Run lengthwise in straight rows

Eastern Filbert Blight Damage



Photo: landscapeonline.com



Photo: Jay W. Pschiedt

- Dead branches with leaves still attached “flag” disease
- Girdled branches are killed, plant vigor declines, death of susceptible varieties in 5-10 years